

DEPARTMENT OF DEFENSE BLOGGERS ROUNDTABLE WITH DR. WILLIAM REES, JR.,
UNDERSECRETARY OF DEFENSE FOR LABORATORIES AND BASIC SCIENCES VIA TELECONFERENCE
TOPIC: \$1 MILLION 1ST PRIZE "WEARABLE POWER" TIME: 1:02 P.M. EDT DATE:
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MR. REES: Well, Jack, why don't we go ahead and get started, and then
if he joins us, we'll stop for a minute and do a quick introduction and continue
to move on, okay?

CHARLES "JACK" HOLT (chief, New Media Operations, OASD PA): All right,
that sounds --

MR. REES: I'll let you do the introductions, and then we'll go from
there.

MR. HOLT: All right, sounds good. And Dr. William Rees, Jr., deputy
undersecretary of Defense for Laboratories and Basic Science from DOD, with us
on the bloggers roundtable this morning.

And Dr. Rees, welcome. We're glad you could be with us, and thank you
very much for taking the time.

Do you have an opening statement for us?

MR. REES: I want to thank everyone for joining us. I appreciate the
opportunity to visit with you guys.

We put out our announcement for the defense power prize, the
opportunity to have a wearable power generation system. We put it out on the
web a couple of weeks ago, so the website's open and it's got all the nitty-
gritty details about the prize. I want to go over a couple of things on that
and highlight them.

It is a \$1 million purse, and why we're doing this is just to get the
weight down. Right now, frequently, depending on the missions, we have our
dismounted troops, mostly Army and Marine Corps, that are going out with up to
40 pounds of batteries for their mission depending on what they're doing. And
in exchange for a \$1 million check, we want someone to demonstrate for us that
they can have a four-day duration, which would be a typical mission for many of
the units, that weighs for the entire system four kilograms or less. So
translating that from a current weight of, in most cases, 20 kilograms down to
about four kilograms is a big stride forward.

The details, again, are at www.dod.mil/ddre/prize or -- as I've demonstrated now two continents with no testing; I've done it live, which is always a little bit dangerous -- you can Google defense power prize. And 10 of the first 12 hits typically turn out to be some story related to this that someone's gotten out there in the last couple of weeks just by simply Googling defense power prize.

I want to also do one more item here, and that's clear up who it is that's doing it. It's my boss, Mr. John Young. He's the chief technology officer for the department. He's the director of Defense, Research and Engineering. And it's important to us that everyone understand this is the first one, but it's not the last one. So this is the inaugural prize that we're doing at the department level.

DARPA's done prizes in times past that were just for DARPA. This is kicking it up higher to the whole department level, and there will be others that will be announced, although this is the inaugural one that's coming out.

And with that, I think I'll just respond to a few questions in the round table if anyone has any.

MR. HOLT: All right. Thank you very much, Dr. Rees.

Sean Meade, you were first online. Why don't you kick us off.

Q I'll pass first, Jack.

MR. HOLT: Okay. David?

Q I'm sorry. I'm having kind of a hard time hearing Dr. Rees. Is -- Dr. Rees, are you on a conference call or -- not a conference call -- a speakerphone?

MR. REES: I am on a speakerphone, and I will lean in a bit closer. Is that helpful to you, David?

Q Okay. That does help a bit, thank you. Okay. So we've seen with -- a sort of previous incarnation of an integrated, wearable -- not a power system exactly, but this soldier system, Land Warrior, and the thing didn't quite -- it didn't quite work. It seems like we're setting the bar really high with this wearable power system. I mean, how realistic do you think this is?

MR. REES: Well, we are setting the bar high. Thank you for the question.

Q Hello?

MR. REES: Uh-oh. Did I lose you, David? Q Hi. I don't know. Can you hear me now?

MR. REES: I heard everything that was in the question. Are you getting the beginnings of my answer okay here?

Q No. Can you start over?

MR. REES: Sure. You're absolutely right, we are setting the bar high. We don't think it's unrealistically high, but we acknowledge it's a challenge.

And we really did intentionally think through this and spend a lot of time and effort and energy looking at -- and the Army had been one of the primary investors in this technology -- looking at what the Army had done in many different subprograms and projects, what DARPA had done in some of theirs, as well as what some independent vendors had brought into the department over a period of time. And looking at what we thought was an easy grab -- and then we set the bar real high, so we know it's not an easy grab.

We think it's realistic, but we think it's going to be really challenging. We're not sure that any of the current approaches that we see, with little tweaks around the edges, will meet this objective. It may require a major change, it may require integrating best advances that have occurred, many of those advances in subsystems and components and integrating them together into a system. And at the end analysis, it still may be a trade, and the trade may be that we're not quite getting every single little thing that we dreamed for, but we're getting everything that we have to have.

And so I think some of the earlier programs -- they had a lot of dreams built in them. We're just looking at a hard system that's going to take a lot of abuse when it's being used in the field, and it'll deliver the power when it's needed.

Q Could I follow up on --

MR HOLT: Yeah. Yeah, go ahead.

Q So I'm taking, then, that you're leveraging some of the advances made in recent years with battery chemistries and battery shaping. I mean, do you envision this thing might be simply a wearable set of batteries that are lighter and denser in terms of power than before?

MR. REES: Sure. We would not exclude that option. That's an option that is on the table. Many other options are on the table, too.

Certainly I'm not married to any one particular approach. I think that based on what we have seen so far, incremental improvements in battery technology are not going to get us to four kilograms.

MR HOLT: Okay.

Andrew.

Q Yes. Doctor, good afternoon. Andrew Lubin from ON Point. You mentioned earlier that the average Marine or soldier carries 40 pounds of batteries. What is the -- what do they carry that needs that much battery power?

MR. REES: Well, let's see. There's a long list, and we don't have enough time, but let me take a crack at the beginning of it, okay?

Q Okay.

MR. REES: At least one radio, so in communications gear in general, usually it's more than one radio.

Depending on what particular weapons system they're carrying, they have one or more sighting mechanisms that are part of their weapons system. Each of

those takes power. Depending on what particular theater they're in and what particular mission they're on, they may well have one or more PDAs. Again, depending on what particular mission they're on, they may have one of the hand-held Phraselators or translators or electronic phrase translation, text translation or speech translation devices.

Depending on where they're at, they may be carrying batteries that are creating an electronic warfare signature for them.

If they're operating at night, they're running night vision. It doesn't matter where they're at, what they're doing or when they went out; they got GPS.

By the time you start adding all of that up, starting out with the big one there, which was comms, because remembering that in many situations they are carrying more than one radio --

Q Okay.

MR. REES: -- and in the weapons systems, depending on what they've got, there may be as many as four or five different battery- powered accessories. That's one piece of their weapons system.

Q Wouldn't it be easier to cut down some of the set they're carrying? I mean, it seems to me we're getting so high-tech -- and I've been overseas, as has David -- these guys have trouble getting over the walls, they're so loaded up.

MR. REES: I'll give you sort of three takes on that, and you -- send it any way you want. How's that?

Q Okay.

MR. REES: One take on it is, I'm not real sure we're going to lighten their pack at the end of the day. So one take on it is, we may get batteries out, and they're going to take more bullets or they're going to take more water or they're going to take more rations for a longer-duration mission. So we may or may not lighten their pack at the end of this mission and we will accomplish the mission. We will get them a better power system. I'm convinced of that. That's one take on it.

I'll give you another take on it. I don't think we're going to go gadget-light in the future. I think we're probably going to go gadget-heavier. If you sit down and look at all the roadmaps that we see coming through here every day, we see all kinds of neat capabilities, really neat capabilities, that are right around one corner or right around two corners, that would enhance the mission performance of our warriors even more.

Q But if you take, if I can interrupt, but then if you take a bullet through your battery pack and you don't know what you're doing, you've got a bunch of kids on the ground who aren't -- and I'm thinking about Captain King, in the Jessica Lynch group, who got lost because he loaded his GPS wrong and the batteries died. Then they're so high-teched up, they don't know how to be soldiers and Marines. Isn't that an issue?

MR. REES: I guess we're taking it a little bit different. And that is it may not look quite like this but it's going to look not terribly different

than something that's an outlet with a socket you plug in. And so I'm not biased in what it has to look like, but it's going to look something like that. And so every particular soldier or every particular Marine may not have the same gadgets to plug in, but I don't think that's going to be a big issue. I've got more confidence that this will be closer to foolproof than in certain batteries in a flashlight.

But there's a third tack that I take on this also. And that is independent of how much weight we've given them with gadgets today, independent of how many more gadgets we may give them in the future that'll make them even better warfighters and give them enhanced capabilities, independent of if we skinny the weight out from batteries and they take more bullets or more water or more rations, I think there's a third thread you might take in on this. And that is if we accomplish this for the average mission, we can do a whole lot for some of those extended missions.

And so the average mission here carrying 40 pounds -- some of them don't carry but 20 pounds. But some of them take --

Q Well, the average Marine combat load is 70 pounds, and there's no batteries in there.

MR. REES: That's right, but some of them are actually taking 95 to 110 pounds. And so on the margins of that, we make a big impact. And so I would say, knocking 20 pounds out of a 65 or 70-pound pack, it matters. It matters more if we're knocking 20 pounds out of 105- pound pack.

Q Oh, for sure, because I'm looking at -- I'm thinking of a scenario where when I was in Afghanistan with some soldiers and we were in a firefight and they got down, they're so loaded up with the shoulder pads and the Kevlars and the flaks, they have trouble shooting from a prone position because they've got too much equipment in the way. We've got these kids loaded up so much, they can't be -- they don't know how to be infantrymen anymore.

MR. REES: Wouldn't disagree -- I hope we're working in the right direction to get the volume down as well as the mass down. And certainly a lot of the batteries that they're using now are specialized government-special batteries that are fairly bulky. If we get this down to -- whether it fits on a utility vest or not is to be determined -- but get it down to a wearable system, getting the mass out's one issue. But you're absolutely right. It's going to drive the volume out as well, at least some of the volume.

Q I mean, because I carry a -- I have a decent Kodak camera. And I come back every night and I plug it into my hooch and I recharge it.

And I'm thinking for the PDAs, the translator, the bits and pieces, the GPSs, I don't need a military battery. I got a nice one from Kodak and it lasts three to four days, and they borrow my camera because their military stuff runs out before my commercial stuff does. It's like we over -- is there any possibility that we overuse technology?

MR. REES: No, I don't think so. I think that if you look particularly at the batteries that some of our radios are built around, they are ruggedized to mil spec. And although we could always tweak at the margins and improve that technology, they work pretty good in almost every circumstance we stick them in.

Q Okay.

MR. REES: And there are spaces where commercial systems look pretty good until you start sticking them in all of the different environments that we have to stick stuff in, and then they begin failing.

Q Okay. Thank you.

MR. HOLT: And Matthew Felling (ph), did you happen to join us? Are you online? (No response.) Okay.

Well, any follow-up questions?

Q Yes. This is David.

MR. HOLT: Yes, go ahead.

Q Okay. How about a solar-powered suit? Can we do that?

MR. REES: I tell you what. Everything's on the table. The one thing I would -- if someone asked me in a different discussion, you know, "Do we want to be robo-cops, do we want to be robo-soldiers," I don't know about that. We are today, bar none, we are the most technologically advanced military the world has ever seen, period. That gives us an overwhelming advantage in many situations. That advantage that we get is one that we're going to stay ahead of the power curve. We are not going to give up on that. So, I wouldn't -- at the moment, anyway, I wouldn't foresee us giving up on our technological advantage that we're driving forward on. You know, I guess there's other pieces of that. I'd be open to a follow-up if you've got one. I don't think I sort of fully gave you everything you were looking for there. But there are other pieces of it.

Q David, do you mind? Are you going to go ahead?

Q No, let me throw one more out there, okay?

Q Please. Okay.

Q So what about -- I mean, soldiers rarely go very far from their vehicles. Would you consider this a valid competitor for this competition if it were some sort of system that plugged into the power system of a Stryker or even their Humvee or something that could export power?

MR. REES: Nope.

Q No?

MR. REES: Nope.

Q No.

MR. REES: That might be an interesting advance, but it wouldn't get a million-dollar purse.

Q Okay. So it has to be totally independent of any kind of vehicle.

MR. REES: Yeah. You know, someone asked me, again, you know, well, what if it really does something revolutionary, like it harvests energy off your heart beat? Well, I don't know if we know how to do that, but if someone can

meet all the requirements that are in here and that's the technology they use, why not?

Q Okay.

MR. REES: The one thing I would say is, we're not driving at keeping the guys and girls that have to wear these awake for four days. And so that was one thing I would take off the table, is if it requires you to do arm curls for 48 hours or if it requires you to do squat-thrusts for 48 hours in order to run it, that's a non-starter.

I think it might be neat if we had some sort of system that, you know, popped into a power port on a Stryker. That might be neat. It doesn't help you a whole lot, though, when you're down two corners in an alley, around a third corner and up eight flights of stairs. It just doesn't work. The extension cord didn't cut it.

Q Okay. Thanks. MR. HOLT: Okay.

Q David -- Jack, can we -- we've got time, I guess? Only 1:20.

MR. HOLT: Sure. Yeah. Go ahead.

Q Doctor, Andrew Lubin again. I just have -- I keep thinking that we're getting -- I appreciate that we have the most advanced technological army in the world, but there's coming a point where the young men and ladies out there are spending more time on technology than shooting, going on patrol and learning how to do a (stack ?) when you're going into a hostile village. And they're losing their warrior skills for the sake of technology.

And there's been too many instances in the past couple years -- the Pat Tillman thing, the Jessica Lynch thing, and I'm sure David can think of a bunch at the same time -- where these guys are trained for technology, and when the technology doesn't work for whatever reason, they stand there with a thumb up their nose and they don't know what to do. Again, Captain King getting in the wrong side of An Nasiriyah a day late because he didn't know how to run a GPS. You know, people said, "Well, the batteries died." Well, you got to know how to navigate without a GPS.

MR. REES: I would concur with you that the base skills of our warfighters still need to function at a high level in the absence of gadgetry.

Q Okay.

MR. REES: I would -- we've got different backgrounds and different experiences. I would say that in every battle that's ever been fought in recorded history, there's cases where technological superiority permitted one adversary to kick the butt of the other adversary.

Q Understand. But in the end, if you --

MR. REES: In every one of those battles there's cases where technology failed.

Q Right. But --

MR. REES: I imagine that we could pick any one battle in any one war -

Q Okay. But if you look at the Army's shooting requirements now, at 300 or 400 meters their long distance shooting, they no longer have to hit the target. If they're close enough to hit dirt that kicks up from the target, that's considered a hit, but that's wrong, that's a denigration of their basic warrior skills.

MR. REES: I just -- I'm going to have to say that's way out of my field of what I know.

Q Okay.

MR. REES: It may be a fair question for someone else in the department, but I know what I don't know, and you've gone way away from area of my expertise. I apologize for that.

Q No, no, I just -- I've spent a lot of time in the field, as has David here, and I've spent time being the first guy over the wall because I was less encumbered than some of these guys half my age. And I'm holding their rifles and helping them over, and maybe that's not a good thing.

MR. REES: Again, I'm -- in terms of the training that our soldiers or the training that our Marines undergo, I'm not qualified to comment on any standards that we have or on any enforcement we have of that standard. We each have different backgrounds and different experience, and I would defer to other people in the department to address some of those issues.

MR. HOLT: And we can -- and Andrew, we can -- we might be able to follow up with somebody in the training command because, as with everything, the balance between the basic skills and the technology in training is always an important piece. So --

Q Well, I agree. That'd be great. I thank you very much for that.

And again, Doctor, I'm not trying to put you on the spot, I'm just, you know, using some relatively real-world experience and looking at one and trying to balance them off. So I appreciate your time. MR. REES: And I appreciate the point. I mean, in each case where we go through what it is that we're trying to do, we have to keep in sight that what we're trying to do is provide the folks in the field with whatever piece of technology permits them to maintain that overwhelming advantage.

And as we go forward in attempting to do that -- with what we heard directly back from the folks in the field was, can't you just make this pack a little lighter, some of the same comments that you were hearing. And when we began looking at what's in that pack, about the only trade space we found where we thought there could be a big win was in this power area.

MR. HOLT: All right. Dr. William Rees, deputy undersecretary of Defense for Laboratories and Basic Science. Thank you very much for being with us.

Anybody -- any follow-up questions? Have we covered everything here?

Q Hey, Jack. Dr. Rees, while I've got you on the line here, would you be -- perhaps looking at some future interview, would you be able to comment on any basic research in the medical stuff?

MR. REES: Let's see. Maybe. It depends on where that goes.

As you probably know, medical is bifurcated in the department.

Q Right.

MR. REES: And part of it sits in one office and part -- which literally is next door; it's the next office over -- it depends on where you want to hit. Maybe, maybe not --

Q Prosthetics, prosthetic limbs.

(Slight pause.)

MR. REES: Hello?

Q Prosthetic limbs.

MR. HOLT: Okay. Prosthetics and --

Q Well, what about some of these battlefield things, like the clot medicine they made from the -- from coral reefs --

MR. REES: Yeah, some of those things were in fact products of (6-1 ?) to (6-2 ?) to (6-3 ?) investment. And so the ones that came out of our basic sciences program, the ones that came out of our RDT&E Program that we run under DDR&E -- I'm comfortable talking about those.

We do have a whole entire Health Affairs assistant secretary that does most of our medical. And so -- again, depending on where it's heading, he might be better qualified than I am.

MR. HOLT: And, David -- and -- you guys got questions like that, if you want to forward them up to me, I'll send them over to the folks over at DOD, and we'll see if we can those folks on the line and get some interviews going with them as well.

Q That'd be great.

Q (Off mike) -- Jack -- Dr. Rees, take some time, get -- you know, get someone up, and then we'd do another one --

MR. HOLT: Yeah. We can -- Q -- and I appreciate the time.

MR. HOLT: Right. Yeah. We can follow up on this a little bit later.

We're here today talking about the defense power prize project that's going on out there. And, Dr. Rees, thank you very much for being with us today, and we look forward to following up and tracking this as it goes along. We'll see what we come up with.

MR. REES: Well, thank you, Jack. I appreciate the opportunity to visit with everyone and try to have a dialogue, to have an exchange here. And

all we're after is the best innovation that can be found. Prize purses historically -- think about Lindbergh and others, think about the Draper Prize for getting arsenic out of water, that the National Academy of Engineering just did -- historically, they've brought out the best in innovation, and that's all we're trying to do here for our warfighters is bring the very best in innovation. So I thank everyone for an opportunity to chat.

Q Thanks.

Q Thank you, Doctor. Thank you very much for your time.

MR. HOLT: Thank you very much, sir.

MR. REES: Thank you very much.

END.